Claim Amendments Filed 03/20/06 with Response to Office Action mailed by Examiner on 09/19/05 in Patent Application No. 10/619,376

1. – 13. (Canceled)

14. (Currently Amended) An optical fiber, comprising:

a photosensitive core comprising a concentration of a first material that increases the refractive index of the core and a concentration of a second material that is other than boron and that reduces the refractive index of the core;

a cladding disposed about the core for tending to confine light to the core;

at least one longitudinally extending region having a thermal coefficient of expansion (TCE) that is different from the TCE of the cladding whereby the optical fiber is photosensitive and birefringent, and

~~The optical fiber of claim 1~~ wherein the fiber has a polarization beat length of less than 25 mm at a wavelength of 1550 nm.

15. (Currently Amended) An optical fiber, comprising:

a photosensitive core comprising a concentration of a first material that increases the refractive index of the core and a concentration of a second material that is other than boron and that reduces the refractive index of the core;

a cladding disposed about the core for tending to confine light to the core;

at least one longitudinally extending region having a thermal coefficient of expansion (TCE) that is different from the TCE of the cladding whereby the optical fiber is photosensitive and birefringent; and

~~The optical fiber of claim 1~~ wherein the optical fiber has a second mode cutoff wavelength of less than 1800 nanometers.

16. -19. (Canceled)

20. (Currently Amended) An optical fiber, comprising:

a photosensitive core comprising a concentration of a first material that increases the refractive index of the core and a concentration of a second material that is other than boron and that reduces the refractive index of the core;

a cladding disposed about the core for tending to confine light to the core;

at least one longitudinally extending region having a thermal coefficient of expansion (TCE) that is different from the TCE of the cladding whereby the optical fiber is photosensitive and birefringent;

said cladding comprising an index of refraction, and wherein said fiber includes a second cladding disposed about said cladding, said second cladding comprising a second index of refraction that is less than said first index of refraction; and

~~The optical fiber of claim 16~~ wherein the core of the fiber is multimode and the fiber has a V number of at least 4 at a wavelength of 1550 nm.

21. (Currently Amended) An optical fiber, comprising:

a photosensitive core comprising a concentration of a first material that increases the refractive index of the core and a concentration of a second material that is other than boron and that reduces the refractive index of the core;

a cladding disposed about the core for tending to confine light to the core;

at least one longitudinally extending region having a thermal coefficient of expansion (TCE) that is different from the TCE of the cladding whereby the optical fiber is photosensitive and birefringent;

said cladding comprising an index of refraction, and wherein said fiber includes a second cladding disposed about said cladding, said second cladding comprising a second index of refraction that is less than said first index of refraction; and

~~The optical fiber of claim 16~~ wherein the core of the fiber is multimode and the fiber has a V number of at least 4 at a wavelength of 1550 nm and wherein the core comprises a numerical aperture of no greater than 0.09.

22. (Original) The optical fiber of claim 21 wherein the at least one longitudinally extending region comprises at least one pair of longitudinally extending regions spaced from the core, each of said pair having a generally circular outer perimeter.

23 – 24 (Canceled)

25. (Currently Amended) An optical fiber, comprising:

a photosensitive core comprising a concentration of a first material that increases the refractive index of the core and a concentration of a second material that is other than boron and that reduces the refractive index of the core;

a cladding disposed about the core for tending to confine light to the core;

at least one longitudinally extending region having a thermal coefficient of expansion (TCE) that is different from the TCE of the cladding whereby the optical fiber is photosensitive and birefringent; and

~~The optical fiber of claim 1~~ wherein the core comprises a V number of at least 4 at a wavelength of 1550 nm.

26. - 32. (Canceled)

33. - 45. (Previously Canceled)

46. - 49. (Canceled)

50. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core,

said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon; and.

~~The optical fiber of claim 47~~ wherein said optical fiber has a polarization beat length of less than 25 mm measured at a wavelength of 1550 nm.

51. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon; and

~~The optical fiber of claim 47~~ wherein said optical fiber has a polarization beat length of less than 10 mm measured at a wavelength of 1550 nm.

52. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core; and

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon; and

~~The optical fiber of claim 47~~ wherein said optical fiber has a second mode cutoff wavelength of less than 1800 nanometers.

53. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon; and

~~The optical fiber of claim 47~~ wherein said optical fiber has a second mode cutoff wavelength of less than 1200 nanometers.

54 – 56 (Canceled)

57. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core,

said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon; and

~~The~~ wherein said optical fiber ~~of claim 47 comprising~~ comprises a wavelength of operation at which said active material can provide light responsive to being pumped by light having a different wavelength, and where said core comprises a V number of greater than 2.405 at said wavelength of operation.

58. (Previously Presented) The optical fiber of claim 57 wherein said core comprises a V number of greater than 4 at said wavelength of operation.

59. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon;

wherein said outer perimeter of said second cladding is circular; and

~~The optical fiber of claim 48~~ wherein said optical fiber has a polarization beat length of less than 25 mm measured at a wavelength of 1550 nm.

60. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core;

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per

unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon;

wherein said outer perimeter of said second cladding is circular; and.

~~The optical fiber of claim 48~~ wherein said optical fiber has a second mode cutoff wavelength of less than 1800 nanometers.

61. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core; and

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon;

wherein said outer perimeter of said second cladding is circular; and

~~The optical fiber of claim 48~~ wherein said optical fiber has a second mode cutoff wavelength of less than 1200 nanometers.

62. – 64. (Canceled)

65. (Currently Amended) A polarization-maintaining double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction, said active material for, responsive to absorbing pump light, providing light having a wavelength that is different than the wavelength of the pump light;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE), said first cladding for receiving the pump light for absorption by said active material;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding;

a pair of axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, each of said regions being spaced from said core; and

wherein said pair of stress inducing regions can cause sufficient scattering of pump light received by said first cladding such that the absorption of pump light per unit length of said fiber is within 15 percent of the absorption per unit length when said second cladding has an outer perimeter shaped as an octagon;

wherein said outer perimeter of said second cladding is circular; and

wherein ~~The~~ said optical fiber ~~of claim 48 comprising~~ comprises a wavelength of operation at which said active material can provide light responsive to being pumped by light having a different wavelength, and where said core comprises a V number of greater than 2.405 at said wavelength of operation.

66. (Previously Presented) The optical fiber of claim 65 wherein said core comprises a V number of greater than 4 at said wavelength of operation.

67. (Previously Presented) A polarization-maintaining, double-clad optical fiber, comprising:

an axially extending core comprising an active material and an index of refraction;

a first cladding disposed about said core, said first cladding comprising a first index of refraction that is less than said index of refraction comprised by said core, said first cladding further comprising a thermal coefficient of expansion (TCE) and a circular outer perimeter;

a second cladding disposed about said first cladding, said second cladding comprising a second index refraction that is less than said first index of refraction comprised by said first cladding, said second cladding having a circular outer perimeter;

two and no more than two axially extending stress inducing regions for providing birefringence, each of said regions having a TCE that is different than said TCE of said first cladding, and each of said regions having a circular outer perimeter and being spaced from said core, and

wherein said fiber has a beat length of less than 25 millimeters measured at a wavelength of 1550 nanometers and a second mode cutoff wavelength of less than 1800 nanometers.

68. (New) The optical fiber of claim 50 wherein each of said pair of axially extending stress inducing regions is circular.

69. (New) The optical fiber of claim 51 wherein each of said pair of axially extending stress inducing regions is circular.

70. (New) The optical fiber of claim 52 wherein each of said pair of axially extending stress inducing regions is circular.

71. (New) The optical fiber of claim 53 wherein each of said pair of axially extending stress inducing regions is circular.

72. (New) The optical fiber of claim 57 wherein each of said pair of axially extending stress inducing regions is circular.

73. (New) The optical fiber of claim 58 wherein each of said pair of axially extending stress inducing regions is circular.

74. (New) The optical fiber of claim 59 wherein each of said pair of axially extending stress inducing regions is circular.

75. (New) The optical fiber of claim 60 wherein each of said pair of axially extending stress inducing regions is circular.

76. (New) The optical fiber of claim 61 wherein each of said pair of axially extending stress inducing regions is circular.

77. (New) The optical fiber of claim 65 wherein each of said pair of axially extending stress inducing regions is circular.

78. (New) The optical fiber of claim 66 wherein each of said pair of axially extending stress inducing regions is circular.

79. (New) The optical fiber of claim 67 wherein said fiber is constructed and arranged to provide an absorption per unit length that is within 15 percent of a test fiber that is identical to said fiber except that the outer perimeter of the first cladding of the test fiber is shaped as an octagon.